IN THE CLAIMS

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1.   (Currently Amended) An encoding apparatus for encoding frame data containing image data and sound data, comprising:

separating means for separating the image data and [[a]] sound data contained in the frame data;

image data encoding means for encoding the separated image data in sequence from a lower to a higher frequency component thereof, thereby generating image encoded data;

sound data encoding means for encoding the separated sound data in sequence from a lower to a higher frequency component thereof, thereby generating sound encoded data; and

frame encoded data generating means for generating header information by using the image encoded data and the sound encoded data, and generating frame encoded data by using the header information, the image encoded data, and the sound encoded data.

2.   (Original) The apparatus according to claim 1, wherein the header information contains at least one of the size of the image data, image type information of the image data, the length of the image encoded data, the length of the sound encoded data, identification information of said encoding apparatus, the transmission date and time, the start address of the image encoded data, and the start address of the sound encoded data.

3. (Original) The apparatus according to claim 1, wherein said image data encoding means generates a transform coefficient sequence for subbands by performing discrete wavelet transform for the image data, groups subbands of the same level, and sequentially encodes the transform coefficient sequence from a lower- to a higher-level subband, thereby generating the image encoded data.

4. (Original) The apparatus according to claim 1, wherein said sound data encoding means generates a transform coefficient sequence for subbands by performing a discrete wavelet transform for the sound data, groups subbands of the same level, and sequentially encodes the transform coefficient sequence from a lower- to a higher-level subband, thereby generating the sound encoded data.

5. (Original) The apparatus according to claim 1, wherein said frame encoded data generating means generates the frame encoded data by arranging the header information, the image encoded data, and the sound encoded data in the order named.

6. (Original) The apparatus according to claim 1, wherein said frame encoded data generating means generates the frame encoded data by grouping subbands of the same level in the image encoded data and the sound encoded data, and arranging the groups in ascending order of level following the header information.

7. (Original) The apparatus according to claim 1, wherein said frame encoded data generating means generates the frame encoded data by using quasi-frame encoded data composed of a portion of the image encoded data and a portion of the sound encoded data.

8.   (Original) An encoding apparatus for encoding frame data containing image data and sound data, comprising:

separating means for separating the image data and the sound data contained in the frame data;

image data encoding means for hierarchizing the image data into a plurality of types of image data and encoding the plurality of types of image data, thereby generating image encoded data corresponding to a plurality of levels;

sound data encoding means for hierarchizing the sound data into a plurality of types of sound data and encoding the plurality of types of sound data, thereby generating sound encoded data corresponding to a plurality of levels; and

frame encoded data generating means for generating frame encoded data by using the image encoded data and the sound encoded data,

wherein said frame encoded data generating means generates the frame encoded data by forming a plurality of groups of different levels by grouping the image encoded data and sound encoded data belonging to the same level determined on the basis of a predetermined reference, and arranging the plurality of groups in descending order of significance level.

9.   (Currently Amended) The apparatus according to claim 8, wherein the plurality of types of image data hierarchized by said image data encoding means correspond to a plurality of frequency components obtained by a discrete wavelet transform of the image data.

10.   (Original) The apparatus according to claim 8, wherein the plurality of types of sound data hierarchized by said sound data encoding means correspond to

speech data which corresponds to a human voice and non-speech data other than the speech data.

11.   (Currently Amended) The apparatus according to claim 10, wherein said frame encoded data generating means groups encoded data of the speech data as sound encoded data of a significant level together with first image encoded data, and groups encoded data of the non-speech data as sound encoded data of an insignificant level together with second image encoded data.

12.   (Currently Amended) The apparatus according to claim 11, wherein
        the plurality of types of image data hierarchized by said image data encoding means contain a first frequency component obtained by a discrete wavelet transform of the image data and a second frequency component higher than the first frequency component, and
        the first and second image encoded data correspond to the first and second frequency components, respectively.

13.   (Original) The apparatus according to claim 8, wherein the plurality of types of sound data hierarchized by said sound data encoding means correspond to speech data which corresponds to a human voice and not less than two non-speech data obtained by hierarchizing non-speech data other than the speech data.

14.   (Currently Amended) The apparatus according to claim 12, wherein said frame encoded data generating means
        groups encoded data of the speech data as sound encoded data of the most significant level together with the first image encoded data,

groups encoded data of first non-speech data obtained by hierarchizing the non-speech data, as sound encoded data of a level significant next to the most significant level, together with the second image encoded data, and

groups encoded data of second non-speech data other than the first non-speech data, obtained by hierarchizing the non-speech data, together with third image encoded data.

15. (Currently Amended) The apparatus according to claim 14, wherein the plurality of types of image data hierarchized by said image data encoding means contain a first frequency component obtained by a discrete wavelet transform of the image data, a second frequency component higher than the first frequency component, and a third frequency component higher than the second frequency component, and

the first, second, and third image encoded data correspond to the first, second, and third frequency components, respectively.

16. (Original) The apparatus according to claim 8, wherein said frame encoded data generating means groups the image encoded data and the sound encoded data by selectively using a plurality of types of grouping methods.

17. (Original) The apparatus according to claim 16, wherein the plurality of types of grouping methods include a grouping method which gives priority to image quality and a grouping method which gives priority to sound quality.

18. (Original) The apparatus according to claim 16, further comprising:

transmitting means for transmitting the frame encoded data;

detecting means for detecting a decoding status of the transmitted frame encoded data; and

control means for switching the grouping methods in accordance with the detected decoding status.

19.   (Currently Amended) An encoding method of encoding frame data containing image data and sound data, comprising:

~~the~~ a separating step, of separating the image data and the sound data contained in the frame data;

~~the~~ an image data encoding step, of encoding the separated image data in sequence from a lower to a higher frequency component thereof, thereby generating image encoded data;

~~the~~ a sound data encoding step, of encoding the separated sound data in sequence from a lower to a higher frequency component thereof, thereby generating sound encoded data; and

~~the~~ a frame encoded data generating step, of generating header information by using the image encoded data and the sound encoded data, and generating frame encoded data by using the header information, the image encoded data, and the sound encoded data.

20.   (Currently Amended) An encoding method of encoding frame data containing image data and sound data, comprising:

~~the~~ a separating step, of separating the image data and the sound data contained in the frame data;

the an image data encoding step, of hierarchizing the image data into a plurality of types of image data and encoding the plurality of types of image data, thereby generating image encoded data corresponding to a plurality of levels;

the a sound data encoding step, of hierarchizing the sound data into a plurality of types of sound data and encoding the plurality of types of sound data, thereby generating sound encoded data corresponding to a plurality of levels; and

the a frame encoded data generating step, of generating frame encoded data by using the image encoded data and the sound encoded data,

wherein the frame encoded data generating step generates includes generating the frame encoded data by forming a plurality of groups of different levels by grouping the image encoded data and sound encoded data belonging to the a same level determined on the basis of a predetermined reference, and arranging the plurality of groups in descending order of significance level.

21.   (Currently Amended) A program which, when executed by a computer, allows the computer to function as an encoding apparatus for encoding frame data containing image data and sound data, comprising:

[[a]] code of the a separating step, of separating the image data and the sound data contained in the frame data;

[[a]] code of the an image data encoding step, of encoding the separated image data in sequence from a lower to a higher frequency component thereof, thereby generating image encoded data;

[[a]] code of the a sound data encoding step, of encoding the separated sound data in sequence from a lower to a higher frequency component thereof, thereby generating sound encoded data; and

[[a]] code of the̶ a frame encoded data generating step, of generating header information by using the image encoded data and the sound encoded data, and generating frame encoded data by using the header information, the image encoded data, and the sound encoded data.

22.   (Currently Amended) A program which, when executed by a computer, allows the computer to function as an encoding apparatus for encoding frame data containing image data and sound data, comprising:

[[a]] code of the̶ a separating step, of separating the image data and the sound data contained in the frame data;

[[a]] code of the̶ an image data encoding step, of hierarchizing the image data into a plurality of types of image data and encoding the plurality of types of image data, thereby generating image encoded data corresponding to a plurality of levels;

[[a]] code of the̶ a sound data encoding step, of hierarchizing the sound data into a plurality of types of sound data and encoding the plurality of types of sound data, thereby generating sound encoded data corresponding to a plurality of levels; and

[[a]] code of the̶ a frame encoded data generating step, of generating frame encoded data by using the image encoded data and the sound encoded data,

wherein the frame encoded data generating step generates the frame encoded data by forming a plurality of groups of different levels by grouping the image encoded data and sound encoded data belonging to the same level determined on the basis of a predetermined reference, and arranging the plurality of groups in descending order of significance level.

23.   (Original) A recording medium recording the program according to claim 21.

24.   (Original) A recording medium recording the program according to claim 22.

25.   (New) An encoding apparatus for encoding image data and sound data, comprising:

input means for inputting image data and sound data corresponding to a frame;

image data encoding means for encoding the image data inputted by said input means in sequence from a lower to a higher frequency component of the image data and generating encoded image data;

sound data encoding means for encoding the sound data inputted by said input means in sequence from a lower to a higher frequency component of the sound data and generating encoded sound data; and

frame encoded data generating means for generating header information by using the encoded image data and the encoded sound data, and generating frame encoded data by using the header information, the encoded image data, and the encoded sound data.

26.   (New) An encoding apparatus for encoding image data and sound data, comprising:

input means for inputting image data and sound data corresponding to a frame;

image data encoding means for hierarchizing the image data into a plurality of types of image data and encoding the plurality of types of image data, and generating encoded image data corresponding to a plurality of levels;

sound data encoding means for hierarchizing the sound data into a plurality of types of sound data and encoding the plurality of types of sound data, and generating encoded sound data corresponding to a plurality of levels; and

frame encoded data generating means for generating frame encoded data by using the encoded image data and the encoded sound data,

wherein said frame encoded data generating means generates the frame encoded data by forming a plurality of groups of different levels by grouping the encoded image data and encoded sound data belonging to a same level determined on the basis of a predetermined reference, and arranging the plurality of groups in descending order of significance level.

27. (New) An encoding method of encoding image data and sound data, comprising:

an input step, of inputting image data and sound data corresponding to a frame;

an image data encoding step, of encoding the image data in sequence from a lower to a higher frequency component of the image data and generating encoded image data;

a sound data encoding step, of encoding the sound data in sequence from a lower to a higher frequency component of the sound data and generating encoded sound data; and

a frame encoded data generating step, of generating header information by using the encoded image data and the encoded sound data, and generating

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frame encoded data by using the header information, the encoded image data, and the encoded sound data.

28.　　(New)　An encoding method of encoding image data and sound data, comprising:

an input step, of inputting image data and sound data corresponding to a frame;

an image data encoding step, of hierarchizing the image data into a plurality of types of image data and encoding the plurality of types of image data, and generating encoded image data corresponding to a plurality of levels;

a sound data encoding step, of hierarchizing the sound data into a plurality of types of sound data and encoding the plurality of types of sound data, and generating encoded sound data corresponding to a plurality of levels; and

a frame encoded data generating step, of generating frame encoded data by using the encoded image data and the encoded sound data,

wherein in said frame encoded data generating step, the frame encoded data is generated by forming a plurality of groups of different levels by grouping the encoded image data and encoded sound data belonging to the same level determined on the basis of a predetermined reference, and the plurality of groups are arranged in descending order of significance level.

29.　　(New)　A program for allowing a computer to operate as an encoding apparatus for encoding image data and sound data, upon being implemented by the computer, comprising:

code of an inputting step, of inputting image data and sound data corresponding to a frame;

code of an image data encoding step, of encoding the image data in sequence from a lower to a higher frequency component of the image data and generating encoded image data;

code of a sound data encoding step, of encoding the sound data in sequence from a lower to a higher frequency component of the sound data and generating encoded sound data, and

code of a generating step, of generating header information by using the encoded image data and the encoded sound data, and generating frame encoded data by using the header information, the encoded image data, and the encoded sound data.

30.   (New) A program for allowing a computer to operate as an encoding apparatus for encoding image data and sound data, upon being implemented by the computer, comprising:

code of an inputting step, of inputting image data and sound data corresponding to a frame;

code of an image data encoding step, of hierarchizing the image data into a plurality of types of image data and encoding the plurality of types of image data and generating encoded image data corresponding to a plurality of levels;

code of a sound data encoding step, of hierarchizing the sound data into a plurality of types of sound data and encoding the plurality of types of sound data and generating encoded sound data corresponding to a plurality of levels; and

code of a generating step, of generating frame encoded data by using the encoded image data and the encoded sound data,

wherein in said frame encoded data generating step, the frame encoded data is generated by forming a plurality of groups of different levels by grouping the encoded image data and encoded sound data belonging to a same level determined on

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the basis of a predetermined reference, and arranging the plurality of groups in descending order of significance level.

31.   (New) A recording medium storing the program according to claim 29.

32.   (New) A recording medium storing the program according to claim 30.